

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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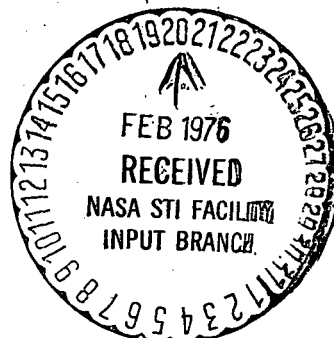
Howard Allaway
(Phone: 202/755-3680)

NOTE TO EDITORS

The NASA press kit for the ESRO-IV mission, dated Nov. 6, 1972, contains an error in the general release concerning manufacture of the ESRO-IV spacecraft.

The spacecraft was built under overall direction of Hawker Siddeley Dynamics of the United Kingdom. Main subcontractors were A.E.G.-Telefunken of West Germany; and Fiar, Laben and Selenia, all of Italy. Other contract work was done in Denmark, France, The Netherlands, and Spain.

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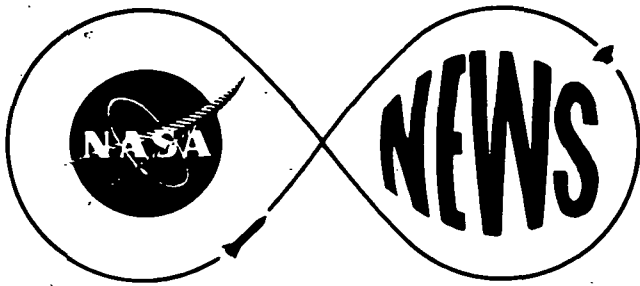


November 16, 1972

(NASA-News-Release-72-214) NASA TO LAUNCH
EUROPEAN SPACECRAFT (NASA) 13 p

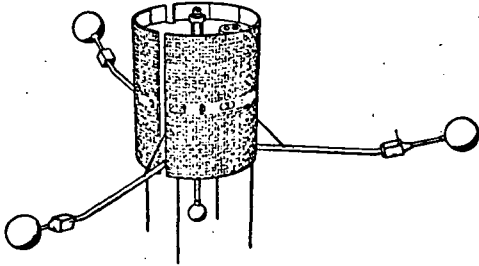
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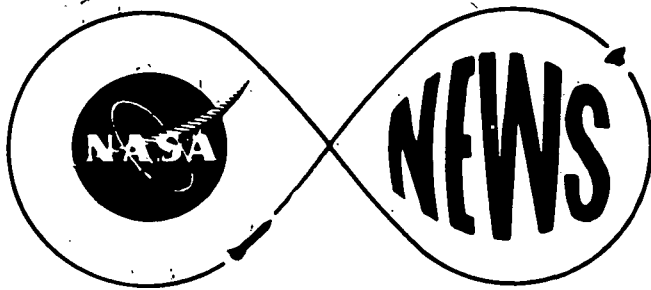
PROJECT: ESRO-IV

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November 17, 1972

Howard Allaway
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RELEASE NO: 72-214

NASA TO LAUNCH EUROPEAN SPACECRAFT

ESRO-IV, a scientific spacecraft designed and built in Europe, is scheduled to be launch by NASA on a Scout launch vehicle from the U.S. Western Test Range in California no earlier than November 20, 1972.

The 130-kilogram (286-pound) satellite will carry six scientific and technological experiments that will investigate and measure several phenomena in the Polar ionosphere, a region of high ion density that begins in the upper atmosphere and extends to an indefinite height in space.

ESRO-IV will be launched under an agreement which provides that NASA will furnish launching and associated services to the European Space Research Organization (ESRO), on a reimbursable basis.

-more-

November 6, 1972

ESRO members are Belgium, Denmark, France, Federal Republic of Germany, Italy, The Netherlands, Spain, Sweden, Switzerland, and the United Kingdom.

The orbit planned for ESRO-IV is near-Polar, inclined 90.8 degrees to the Equator, with an apogee of 1,100 kilometers (682 statute miles) and a perigee of 280 kilometers (173 statute miles). The orbital period will be 98.4 minutes.

Scientific measurements made by the satellite will be concentrated over Northern Europe to correlate ground-based Polar ionosphere observations and simultaneous measurements made with sounding rockets launched from Kiruna, Sweden.

Basic objectives of the ESRO scientific experiments, and their investigators are:

- Investigate ionospheric species, their energy distribution and drift velocity; total ion density and irregularities; electron temperature and density. Mullard Space Science Laboratory of University College, London, England.

- Study the composition and density of neutral gas particles and their variations with respect to altitude, latitude, season, and local time. Institute of Physics, University of Bonn, Federal Republic of Germany.

- Investigate the mechanism of low-energy particle precipitation in the auroral zones and other auroral events. Kiruna Geophysics Observatory, Kiruna, Sweden.

- Study Polar Cap absorption events and high-energy particles of solar origin, their propagation in interplanetary space, and how they enter the magnetosphere. Laboratory for Space Research, Sterrekundig Institute, Utrecht, The Netherlands.

- Measure the flux and energy spectrum of solar flare particles, trapped particles in the Earth's lower radiation belt, and galactic and non-solar energetic particles. Max Planck Institute for Extraterrestrial Physics, Garching by Munich, Federal Republic of Germany.

- The sixth experiment is a technological experiment to qualify for space flight a European-built, infra-red horizon sensing instrument that takes attitude measurements of spinning satellites. The investigator is the European Space Research and Technology Center (ESTEC), Noordwijk, The Netherlands.

ESRO-IV is a cylindrical spacecraft with body-mounted solar cells. Three radial booms, hinged at the bottom of the craft, are folded forward along its sides during launch. The booms contain sensors for part of the ionospheric species experiment; they are deployed in orbit under the influence of centrifugal forces caused by the spinning motion of the satellite.

A fourth boom, mounted on the spacecraft's bottom, is stowed inside the center of the craft during launch; it is deployed immediately after the radial booms.

The satellite is spin stabilized at an initial spin rate of 60 to 75 revolutions per minute.

Boom deployment is automatically begun after the spacecraft separates from the Scout-D launch vehicle. If the automatic system fails, however, deployment can be initiated by ground command.

ESRO will be tracked and interrogated by the European Satellite Tracking, Telemetry and Telecommand Network (ESTRACK). Assistance will be provided by NASA's world-wide Space Tracking and Data Acquisition Network (STADAN), operated by NASA's Goddard Space Flight Center, Greenbelt, Md., and by the Centre National d'Etudes Spatiales (CNES) in France.

NASA direction of the project is by the Office of Space Science, NASA Headquarters, Washington, D.C. NASA's Langley Research Center, Hampton, Va., has management responsibility for the Scout launch vehicle program.

ESRO-IV was built by the Laboratoire Central de Telecommunications, Paris, in association with Contraves A.G., Zurich, and Bell Telephone Manufacturing Company, Antwerp, under direction of the European Space Technology Center (ESTEC) at Noordwijk, The Netherlands.

The Scout-D launch vehicle is built by Ling-Temco-Vaught Inc., Dallas, Texas.

Launch services will be provided by the Kennedy Space Center's Western Test Range Operations Division, Lompoc, California, in cooperation with Langley's Scout Project Office.

(END OF GENERAL RELEASE; BACKGROUND INFORMATION
FOLLOWS)

LAUNCH VEHICLE

The Scout-D launch vehicle is a four-stage, solid-fuel rocket system. Scout S-185 and the ESRO-IV spacecraft will be set on an initial launch azimuth of 183.131 degrees to obtain a retrograde orbit.

The four Scout-D motors -- Algol III, Castor IIA, Antares II, and Altair III -- are interlocked with transition sections that contain guidance, control, ignition, instrumentation system, separation mechanics, and the spin motors needed to stabilize the fourth stage.

Guidance for Scout-D is provided by an autopilot and control achieved by a combination of aerodynamic surfaces, jet vanes and hydrogen peroxide jets. The vehicle is approximately 22.25 meters (73 feet) long and weighs about 21,485 kilograms (47,267 pounds) at liftoff.

FLIGHT SEQUENCE

| <u>Event</u> | <u>Time</u> (Min-Sec) |
|--|--------------------------|
| Liftoff | 00:00 |
| First Stage Burnout | 01:21 |
| Second Stage Ignition | 01:24 |
| Second Stage Burnout | 02:04 |
| Heat Shield Ejection | 03:02 |
| Third Stage Ignition | 03:04 |
| Third Stage Burnout | 03:40 |
| Spin-up | 05:56 |
| Third Stage Separation | 05:57 |
| Fourth Stage Ignition | 06:02 |
| Fourth Stage Burnout & Orbital Injection | 06:36 |
| Radial Booms Deploy/De-spin to 65-70 rpm | 07:35 |
| Payload Separation | 10:57 |

ESRO PROGRAM PARTICIPANTS

European Space Research Organization (ESRO)

| | |
|---------------------|--|
| Dr. A. Hocker | Director General, ESRO and Program Manager |
| J.F. Lafay | ESRO-IV Project Manager, ESTEC, Noordwijk, The Netherlands |
| Dr. Johannes Ortner | Assistant Director for Space Mission, ESRO |
| O. Hammarstrom | Director of ESTEC |
| U. Montalenti | Director of ESOC |

National Aeronautics and Space Administration

| | |
|--------------------|--|
| Dr. John E. Naugle | Associate Administrator for Space Science, NASA Headquarters |
| Joseph B. Mahon | Launch Vehicle and Pro- pulsion Program |
| Robert W. Manville | Director, NASA Headquarters Program Manager, Small Launch Vehicles and Inter- national Projects, NASA Headquarters |
| Paul E. Goozh | Scout Program Manager, NASA Headquarters |
| Samuel J. Ailor | Assistant Head, Scout Project Office, Langley Research Center |
| Joseph B. Talbot | Scout Payload Coordinator Langley Research Center |
| Rodney L. Duncan | Operations Engineer, Langley Research Center |

Patrick H. Shea

Mechanical Systems,
Langley Research Center

Azusa Yamamoto

Electronics Systems,
Langley Research Center

Thomas L. Owens

Fluid Systems,
Langley Research Center

William D. Hinshaw

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Western Test Range

Henry R. Van Goey

Manager, KSC Unmanned
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Test Range Operations Divi-
sion

C.R. Fuentes

ESRO-185 Coordinator
KSC Unmanned Launch Opera-
tions Western Test Range
Operations Division

ESRO-IV MISSION IN BRIEF

Launch Window: 7:15 to 7:30 p.m. EST, Nov. 20, 1972.
Window changes only slightly from day to day.

Launch Site: Western Test Range, Lompoc, California,
Pad SLC-5.

Launch Vehicle: Four-stage, solid fuel Scout-D.

Orbit: Apogee: 1,099.7 kilometers (about 682 statute miles)
Perigee: 280 kilometers (about 173 statute miles)
Period: 98.4 minutes
Inclination: 90.8 degrees

Stabilization: Spacecraft will be spin-stabilized. Spin axis can be reoriented to achieve different satellite attitudes as required by the experiments. Reorientation of spin axis will be achieved by magnetic control, using actuators and sensors of the attitude control system.

Spacecraft: Weight: 130 kilograms (286 pounds)

Structure: Cylindrical body whose overall height is 138 centimeters (about 54 inches) and whose diameter is 76 centimeters (about 30 inches).

Appendages: Three experiment booms that extend from bottom of spacecraft perpendicular to spin axis. One experiments boom that extends along spin axis from bottom of spacecraft. Four telemetry antennas that extend from bottom rim of spacecraft.

Power: 6,990 solar cells mounted on spacecraft surface supply an average of 23 watts to operate spacecraft systems and to keep the battery charged.

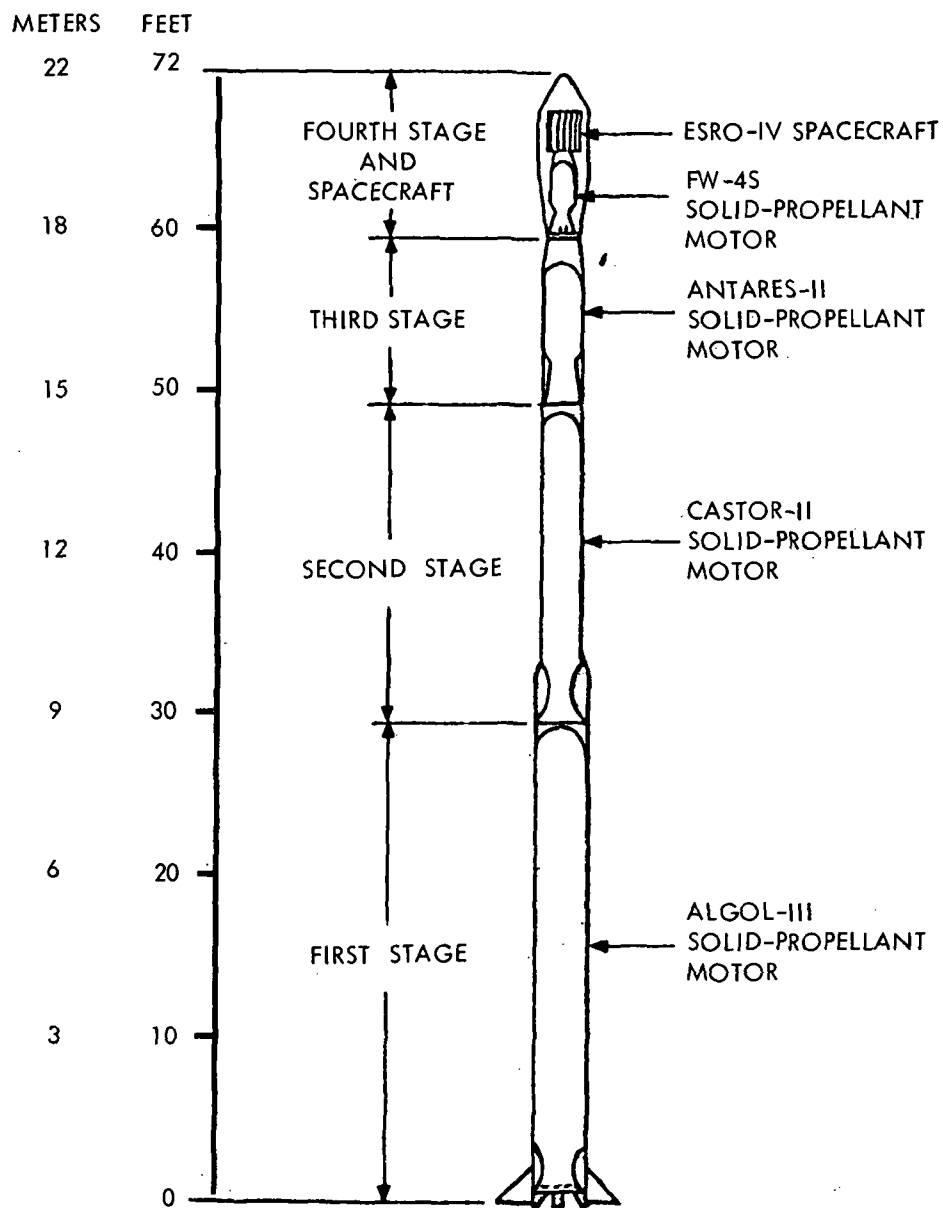
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Spacecraft Control: Primary control of ESRO-IV is maintained at the European Space Operations Center (ESOC) in Darmstadt, West Germany.

Tracking: The satellite will be tracked through the European Satellite Tracking and Telecommand Network (ESTRACK), operated by the ESOC in Darmstadt. NASA's world-wide Space Flight Tracking and Data Network (STDN) will provide limited tracking and data acquisition support.

Telemetry: Spacecraft has a split phase telemetry system using two transmitters, both of which operate on the same carrier frequency. Data can be sent continuously, in real-time low-speed transmission, or intermittently by playback of tape recorder as alternative to high-speed, real-time transmission in mixed data mode, which consists of low-speed plus high-speed data or low-speed plus playback data. Low-power transmitter has power output of 0.3 watts and operates on 137.200 megahertz. High-power transmitter has power output of 2.8 watts and operates on 137.200 megahertz.

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SCOUT LAUNCH VEHICLE